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DEFENSE SYSTEMS MANAGEMENT COLLEGE

STUDY TITLE: PROCUREMENT METHOD CODING (PMC): A DESCRIPTIVE ANALYSIS

STUDY PROJECT GOALS:

To identify in USAF and analyze the level, process and boundary spanning activity of the PMC decision process. To examine guidance extant to optimize the PMC decision. To identify interested parties and any PMC advocate. To identify opportunities for PMC improvement.

STUDY REPORT ABSTRACT: Procurement method coding decides how to purchase required spare parts: from the prime contractor, his vendor, or in broad competition.

A systems approach to examine the Procurement Method Coding (PMC) process is used. The environment, goals, technical psychosocial and structural systems of the PMC decision process are examined. The uniting managerial system is also examined. After this examination directed at the basic who, what, when, where and why of the PMC process, an analysis is made.

The interested parties include the contractor, the Air Logistics Center, AFR 57-6: DOD High Dollar Spare Parts Breakout Program Manager, and his Air Force Logistics Command Counterpart. These parties are central to the decision process. Other key disciplines sometimes included are the procurement, small business, judge advocate and maintenance persons. The PMC decision is made by engineers often in consultation with others.

The management of this decision process is examined and several opportunities for improvement at the ALC, AFLC and USAF levels are offered.

SUBJECT DESCRIPTORS: procurement, spares, technical data, reprourement

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WALTER R. MONTGOMERY JR., MAJOR, USAF	PMC 76-2	NOVEMBER 1976

DEFENSE SYSTEMS MANAGEMENT COLLEGE



PROGRAM MANAGEMENT COURSE INDIVIDUAL STUDY PROGRAM

PROCUREMENT METHOD CODING (PMC):
A DESCRIPTIVE ANALYSIS

STUDY PROJECT REPORT
PMC 76-2

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PROCUREMENT METHOD CODING (PMC):

A DESCRIPTIVE ANALYSIS

Study Project Report

Individual Study Program

Defense Systems Management College

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Class 76-2

by

Walter R Montgomery Jr
Major USAF

November 1976

Study Project Advisor
Dr Joseph Hood

This study project report represents the views, conclusions and recommendations of the author and does not necessarily reflect the official opinion of the Defense Systems Management School or the Department of Defense.

EXECUTIVE SUMMARY

The purpose of this study is to identify and analyze within the Air Force the level and process plus the boundary spanning activity of the procurement method coding (PMC) decision. This subset of Integrated Logistics Support (ILS) in the weapon system acquisition cycle is examined as a long lasting decision. The extant guidance, structure and accomplishments are examined in a descriptive analysis.

With growing pressures on procurement dollars, the accuracy and effectiveness of decisions regarding how spare parts shall be purchased are becoming increasingly important. The ability to support operational readiness requirements at the lowest possible price consistent with quality requirements is a substantial management issue directly related to the PMC decision. For the Air Force, Air Force Logistics Command has PMC responsibility.

The Air Logistics Centers effect the PMC decision process by means of an AFR 57-6: DOD High Dollar Spare Parts Breakout Program Manager, located in the Directorate of Material Management. The program manager convenes a team of experts on an ad hoc basis to evaluate contractor recommendations and supporting information related to that recommendation. A procurement method code is assigned dictating the method of purchase usually for the lifetime of the weapon system. Compliance with the PMC assigned is expected of the procurement contracting officer (PCO). Often procurement, user and other interested parties to the decision do not have an input to the decision process.

ACKNOWLEDGEMENT

To the many persons who freely gave of their time and wisdom, I am sincerely appreciative. A partial list appears in the Bibliography of this study. The encouragement and guidance of my faculty advisor, Dr. Joe Hood, provided a choice learning experience. For my wife and children who supported and encouraged me during the long separation represented by this paper, I am truly grateful. The patience and diligence of my typist, Mrs. Kimberly Stockett are noteworthy. The errors are my own.

If there is no struggle there is no progress. Those who profess to favor freedom, and yet deprecate agitation, are men who want crops without plowing up the ground. They want rain without thunder and lightning. They want the ocean without the awful roar of its many waters.

-Frederick Douglass

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CHAPTER I

INTRODUCTION

An ever increasing awareness of conflicting priorities competing for limited National monetary resources characterizes the weapon system acquisition community. The total cost of ownership under the aegis of life cycle costing initiatives clearly recognizes the need to make prudent choices among alternative courses of action. "Over the past decade the annual unit cost to operate and support ships and aircraft systems has increased severalfold." (10:1) The resulting actions include greater emphasis upon early application of Integrated Logistics Support (ILS) functional disciplines in the weapon system acquisition cycle. Even in the conceptual and validation phases, ILS functions made up of varied disciplines seek to reduce the post-delivery support burden of new weapon systems without sacrificing the stated technical performance requirements.

(5)

Background

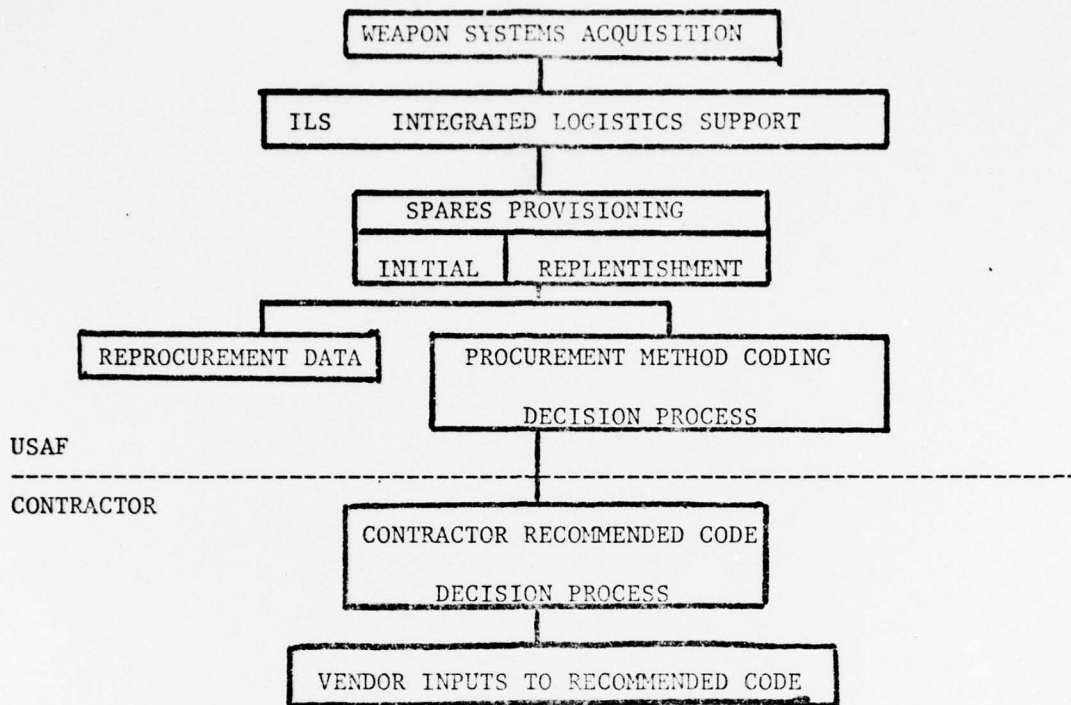
One of the key elements of logistics support is having the required spare parts on hand when required to keep the weapon system operating in a combat ready status. By conducting Logistics Support Analyses (LSA), requirements are determined and provisioning of required items is addressed.

Broadly defined, provisioning means laying in an adequate supply of material, when and where needed with the dollars we have available to support a system or piece of equipment during its initial period of operation . . . Our main objective is to assure that the development of effective logistics support is systematically planned, acquired and managed as an integrated whole to obtain maximum readiness and optimum cost effectiveness. (6:1-1)

Supporting the USAF operational forces and assuring their material readiness is the job of the Air Force Logistics Command (AFLC). The AFLC headquarters is at Wright Patterson AFB, Ohio. The Command manages approximately \$12.3 billion annually and controls a support inventory valued at nearly \$13.8 billion to maintain the USAF equipment inventory in excess of \$44 billion. In addition to support of USAF equipment AFLC manages nearly 2,700 individual foreign military sales contracts valued in excess of \$3.6 billion. (41:63) The provision of required support supplies and services may take two shapes -- initial provisioning or replenishment procurements.

Fundamental to the procurement process is an availability of information regarding the essential features of the support hardware or software required. Also essential is an idea of how and where the support items should be bought. The critical tolerances and functions plus the frequently complicated nature of parts in complex weapon systems cause the parts to have characteristically high value. This somewhat restricts the sources of resupply. To determine the optimal source, the procurement method coding process is applied. The detail design process results in the production of data or information such as specifications, drawings, processes, etc. Procurement method coding determines which of these design data shall be purchased for use in reprourement, based upon the decision of how to procure.

Figure 1.



Scope

The purpose of this paper is to examine that subset of Integrated Logistics Support (ILS) known as Procurement Method Coding (PMC) applied during Full Scale Development, Production or Deployment Phases of weapon system acquisition. See Figure 1.

Attention is focused upon the role of AFLC in the PMC decision process using a systems approach to help managers understand their organizational context. Specific areas of interest include the direction and policy (goals), the techniques (technical), the inter-personal (psycho-social), and the hierarchy (structural) subsystems. Further, the managerial subsystem, uniting the four previously mentioned subsystems, as well

as the environmental supra system and external forces will be examined. (23)
Major foci will be the decision level and process as well as boundary spanning interfaces, activities or elements in the PMC process.

Terms

To assure understanding, the more important terms are included from Department of Defense (DOD) directives and other regulations.

1. Breakout: The improvement in the procurement status of an item resulting from deliberate management action. e.g., competitive procurement of an item previously purchased non competitively, and purchase of an item from actual manufacturer instead of from the system prime contractor who is not the actual manufacturer. (6:1-9)
2. Contractor Recommended Code: Numeric code identifying contractor recommended method of procurement.
3. Procurement Method Code: Numeric code which identifies optimum method of procurement recommended to the Procurement Contracting Officer (PCO) by material management; basis for assignment is governments' capability to compete and actual market experience; PCO cannot exceed competitive level specified without approval of material management. (1)
4. Screening: Process of evaluating information relevant to the procurement method coding decision process.
5. Spare Parts: Spare and repair parts, reparable and consumable, purchased for use in the maintenance, overhaul and repair of equipment such as . . . guns, aircraft, missiles, ground communications and electronic systems, ground support and associated test equipment . . . from the piece part to subsystem level. (6:1-5)
6. System: Not only the end items of equipment (e.g. Minuteman missile or B-52 bomber), but also the total spectrum of requirements that must exist to make the equipment operable and supportable to the designed performance level in its operating environment during its life cycle. (2:1-2)

CHAPTER II

A SYSTEMS VIEW OF PROCUREMENT METHOD CODING (PMC) IN THE WEAPON SYSTEMS ACQUISITION CYCLE

Kast and Rosenzweig describe the organization as a suprasystem of lower order systems operating in an environment. Each of the lower order systems -- goals, technical, structural and psychosocial -- has a boundary or demarcation line

. . . for the definitions of appropriate system activity for admission of members into the system, and for other imports into the system. The boundary constitutes a barrier for many types of interaction between the people on the inside and people on the outside, but it includes some facilitating device for the particular types of transactions necessary for organizational functioning. (23:114)

The system continually receives feedback from its environment according to Kast and Rosenzweig. This theory in the PMC context is evidenced by the constant dialogue between the government and industry at many levels on a broad variety of issues during the PMC process as well as within the government.

The Environmental Suprasystem

Benjamin Franklin observed two certainties in life -- death and taxes. Certainly a third could be added today -- change. The weapons system acquisition process is future oriented to tomorrow's perceived deficiencies and is in a race with obsolescence, inflation, exploding technology and ever increasing social expectations. The acquisition process, in the environment of rapid change, is required to seek the most satisfactory compromise between lifetime ownership cost, schedule of achievable deployment and adequate, reasonably attainable performance.

The Congress is granted authority, under Article 1, Section 8, of the Constitution, and power to pay the debts and provide for the common defense and general welfare of the United States, to raise and support armies, to provide and maintain a navy, to make rules for the government and regulation of the land and naval forces. Under these powers the Congress influences, by way of legislation and precedent of enquiry, the direction which acquisition will take. Judicial precedent further affects the process and content of acquisition. The Executive Branch initiatives in the diplomatic arena also color the acquisition environment. Finally, the perception of external threats, internal deficiencies or needs, industrial capabilities and socio-economic objectives such as small business and labor surplus area participation in procurements shape the acquisition environment of weapon systems.

The gestation period of a weapon system typically lasts upwards of 10 years. Production and deployment may extend an additional 15 to 20 years or more. The acquisition costs may become astronomical because of such forces as complex demands placed upon the system, multiple missions, extensive testing and production delays.

Further, the marketplace is characterized as being monopsonistic -- one buyer (the government) and many sellers, both prime contractors and subcontractors or vendors. Thus, there are fewer demand elements for defense products than commercial products.

Within the defense establishment, however, there may be several customers (users). For example, the F-4 aircraft has been used by the Air Force, Navy and Marine Corps as well as other free world nations.

It is in this environmental context that the procurement method coding decision process occurs. Within this environment the goals, technological, psychosocial and structural subsystems exist as tied together by the scheme of the management subsystem. To survive, any organization must remain in tune with its environment. The PMC subsystem of the ILS system is no exception.

Contractors are in business to make a profit on the products they develop. Often these products must be incredibly complex to reliably accomplish their required tasks in a combat environment with acceptable reliability. Contractors fear product degeneration when they lose control of spare parts.

Faced with these verities the acquisition managers, Air Force Systems Command (AFSC) and Air Force Logistics Command (AFLC) must give early and lasting attention of the highest calibre to management of costs of ownership in the face of constant public attention, limited national resources and prolonged weapon system use of periods far beyond those of such consumer products as tractors, automobiles or trucks. Such intensive attention has long term effects upon national resources, deeply troubled by inflation, and upon national security as decisions are made in light of change to fit the new realities. "We live in an age of paradoxes, at a time when hope and peril run side by side. To be just and compassionate, we must be strong," reported Secretary of Defense Donald H. Rumsfeld.

(35:viii)

The Air Logistics Center is central to support of strength through readiness. In March of 1975, 808,449 items were being managed by AFLC.

Of these 199,564, items are assigned PMCs. (1) Some key relationships are portrayed in Figure 2 which represents the air logistics team interfaces.

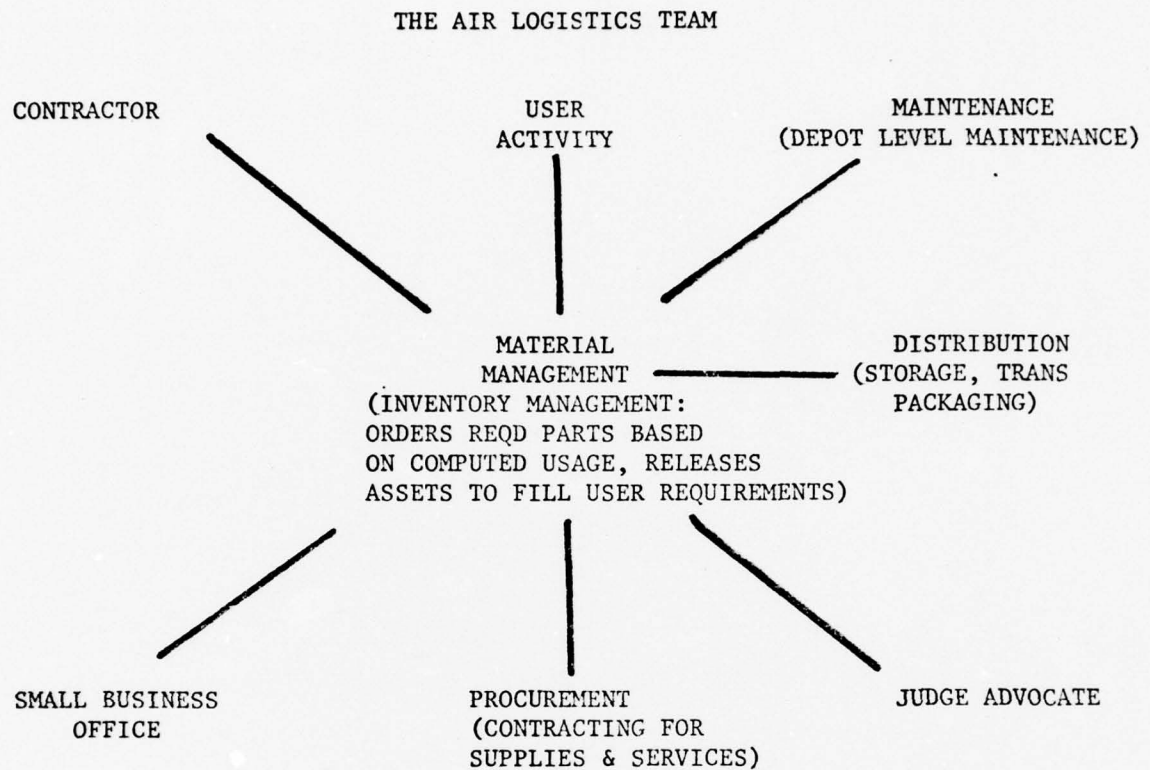


Figure 2.

The PMC Goals Subsystem

Policy and directives establish the goals or desired future conditions for the PMC decision process within the government. These goals decide by what means the necessary spare parts shall be purchased. Policy may be viewed as a footprint of past experience, articulated by leaders during their "watch" of duty. These goals are the basis for control and measurement of planned accomplishment by the individual or the organization.

Current policies set forth by the Armed Services Procurement Regulation (ASPR), have the force and effect of law. They emphasize the strong preference for competitive procurement as reiterated in Public Law 93-400, the "Office of Federal Procurement Policy Act":

Sec 2. It is declared to be the policy of Congress to promote economy, efficiency, and effectiveness in the procurement of property and services by the executive branch of the Federal Government by establishing policies, procedures, and practices which will require the Government to acquire property and services of the requisite quality and within the time needed at the lowest reasonable cost, utilizing competitive procurement methods to the maximum extent practicable . . .

This Congressional policy is threaded throughout current directives. The Joint Service Regulation, AFR 57-6, "DOD High Dollar Spare Parts Breakout Program", reflects the policy of the Office of the Assistant Secretary of Defense (Installations and Logistics) that, "All procurements whether by formal advertising or by negotiation, shall be made on a competitive basis to the maximum practicable extent." (6:1-10) See Figure 3. It is estimated that high dollar items constitute 80% of total projected procurement value. (1)

Implicit in the preceding remarks and in the referenced policy guidance is the need for responsible judgement. This requirement is particularly applicable to the breakout dimension of the procurement method coding (PMC) process. The persons reviewing Contractor Recommended Codes (CRCs) are to assure that the contractors' substantiating data support the CRCs. (28:10) The details of the methodology are discussed under "The Technical Subsystem" below. To accomplish the required judgement, substantial dialogue and contact with industry are required.

Estimates are that competitive breakout will save 25% of the procurement cost when buying from the prime contractor. This makes the goal of competition attractive. (4:3)

Figure 3

<p><u>CONTRACTOR</u></p> <p>CRC ASSIGNED UPON REQUEST OF GOVERNMENT</p>	<p>PROCUREMENT CODING ALTERNATIVES</p>	<p><u>GOVERNMENT</u></p> <p>PMC ASSIGNED AFTER SCREENING OF CRC AND SUBSTANTIATIVE DATA</p>
<p>6 PROCURE BY OPEN COMPETITION</p>	<p>B RESTRICTED TO SOURCES SPECIFIED ON "SOURCE CONTROL", "ALTERED ITEM", "SELECTED ITEM" DRAWINGS/ DOCUMENTS</p>	<p>1 FOUND TO BE ALREADY COMPETITIVE</p>
<p>7 PROCURE ONLY FROM SELECTED SOURCES IAW SUFFIX CODE</p>	<p>C REQUIRES ENGINEERING SOURCE APPROVAL BY DESIGN CONTROL ACTIVITY TO MAINTAIN QUALITY OF PART APPROVED SOURCE(S) ONLY</p>	<p>2 DETERMINED FOR FIRST TIME TO BE SUITABLE FOR COMPETITIVE PROCUREMENT</p>
<p>8 PROCURE ONLY FROM SELECTED SOURCES IAW SUFFIX CODE</p>	<p>D DATA REQUIRED TO PROCURE FROM ADDITIONAL SOURCES NOT AVAILABLE; CANNOT BE OBTAINED; ADEQUATE SPECIFICATIONS CANNOT BE DRAFTED</p>	<p>3 FOUND TO BE PROCURED DIRECTLY FROM ACTUAL MANUFACTURER -- VENDOR OR PRIME CONTRACTOR WHO IS ACTUAL MANUFACTURER</p>
	<p>E PART IS IN PHASED PROVISIONING G TECHNICALLY SUITABLE/LEGALLY CLEAR FOR ADVERTISING. DATA PACKAGE IS COMPLETE</p>	<p>4 DETERMINED FOR FIRST TIME TO BE SUITABLE FOR DIRECT PURCHASE FROM ACTUAL MANUFACTURER RATHER THAN PRIME CONTRACTOR FOR THE END ITEMS WHICH THESE PARTS SUPPORT</p>
	<p>J RESTRICTED TO SUBSYSTEM/PRIME CONTRACTOR BY TOTAL PACKAGE PROCUREMENT CONCEPT IN CONTRACT USED WITH CODE 5</p>	
	<p>K PART IS PRODUCED FROM CLASS 1A CASTINGS (MIL-C-6021) AND REQUIRES REPETITIVE DUPLICATION FOR EACH CASTING/FORGING ALONG LINES IDENTICAL TO THOSE RESULTING IN INITIAL PART ACCEPTABILITY; PROCESS CONTROLLING ACCEPTABILITY</p>	<p>5 DETERMINED NOT SUITABLE FOR COMPETITIVE PROCUREMENT OR DIRECT PURCHASE; CONTINUE TO BUY FROM PRIME CONTRACTOR</p>
	<p>L LOW DOLLAR VALUE MAKES IT ECONOMICAL TO TRY TO IMPROVE PROCUREMENT STATUS</p>	
	<p>M MASTER/COORDINATED TOOLING REQD TO MAKE PART WITHOUT ADDITIONAL TAILORING OR FITTING</p>	
	<p>N PART REQUIRES SPECIAL TEST OR INSPECTION FACILITIES TO DETERMINE/MAINTAIN ULTRA-PRECISION QUALITY FOR PARTS FUNCTION OR SYSTEM INTEGRITY</p>	
	<p>P RIGHTS TO USE DATA FOR PROCUREMENT FROM ADDITIONAL SOURCES NOT LEGALLY AVAILABLE & CANNOT BE PURCHASED</p>	
	<p>Q PART REQUIRES EXCEPTIONAL UNIQUE MANUFACTURING PROCESSES OR MATERIALS</p>	
	<p>V PART DESIGNATED A HIGH RELIABILITY PART UNDER FORMAL RELIABILITY PROGRAM A FAILURE PROBABILITY WOULD BE UNACCEPTABLE CONTINUED CONTROL BY EXISTING SOURCE(S) NECESSARY TO ENSURE RELIABILITY</p>	
	<p>W PART MAY BE PROCURED BY METHOD INDICATED IF MILITARY/INDUSTRY SPECIFICATIONS SUBSTITUTED FOR CONTRACTOR'S DATA WHICH ARE SUBJECT TO GOVERNMENT'S LIMITED RIGHTS USE</p>	
	<p>Y PART DESIGN IS UNSTABLE; ENGINEERING, MANUFACTURING OR PERFORMANCE CHARACTERISTICS INDICATE DESIGN CHANGE; MARGINAL YIELD OR PERFORMANCE IN TEST MAKING PART IN PRESENT DESIGN OBSOLETE & UNUSABLE</p>	

*CODES NO LONGER USED BUT MAY APPEAR IN OLD CONTRACTS PARTS HISTORIES

Source: AFR 57-6, TWO HIGH DOLLAR SPARE PARTS BREAKOUT, MARCH, 1969 AND AFIC SUP 2 THEREOF DATED 4 OCT 74

The goals of competition and responsible judgement are the developments of coordination by top level DOD managers with industry counterparts through such industry associations as Aerospace Industry Association (AIA) and others which have standing committees to address areas of mutual concern. Such boundary spanning activities as conferences and symposia, coordination of proposed policy and military standards serve as facilitators of communications to deal with common problems and goals.

The achievement of policy goals is limited by the understanding and acceptance of those who implement them. The technical limitations which define what is achievable and structural dimensions not in tune with technical and goals subsystems also limit goal achievement. Limits also exist because of inadequate managerial support by and to persons charged with and having skills requisite for achieving the goal.

The Technical Subsystem

Kast & Rosenzweig define this subsystem as "the knowledge required for the performance of tasks, including the techniques used in the transformation of inputs into outputs". Further, the technical subsystem is task driven. That is it is shaped by the "specialization of knowledge and skills required, the machinery and equipment, and the facilities required". (23:111) The technical subsystem is the representation of technology in the procurement method coding organization.

What are the skills required to make the PMC decision effectively? Based upon several telephone interviews with those who participate in the PMC activity and a review of AFR 57-6, responsible judgement is one major requirement. (6:1-12) What are these judgements? In defining the

criteria for screening or evaluating high dollar value spare parts, AFR 57-6 lists certain key criteria. They are

- (1) assembly of the required procurement information and technical information or data from the responsible contractor and his vendors or subcontractors;
- (2) initial evaluation of the data including legal opinion of proprietary claims and adequacy of the information for production;
- (3) data completion, meaning obtaining any mission data elements;
- (4) technical evaluation of the data including engineering review in more depth by various relevant specialties such as stress, metallurgical and quality assurance engineering to determine the developmental status and design stability;
- (5) economic evaluation by the procurement engineer to identify and estimate the direct costs to breakout the item in four areas of concern: requirements for qualification testing, for quality control and inspection, for special tooling or production equipment, and costs required to acquire the needed rights in any proprietary data; and
- (6) supply feedback to assure that if a purchase request is generated there will be enough time for breakout procurement. (6:3-3,4)

From the foregoing criteria certain required technical skills in addition to administrative capability are evident. Legal review, engineering, an awareness of the operational environment and marketplace plus producability characteristics are required. Also a knowledge of use rates and materials' procurement lead times in industry are required. AFR 57-6 spells out 73 steps to be taken in evaluating against the criteria. These detailed steps guide the technical decision process and require 14 pages of discussion in the directive. Throughout the discussion of the detailed steps the emphasis is upon exercise of sound discretion and judgement.

To exercise such traits in evaluation of data requires a mature experience and the ability to reflect back upon past encounters with items similar to those being seen during the PMC evaluation underway.

Inputs from the industry environment are used in support of Contractor Recommended Codes (CRC) and analysis of the recommendations. The initial evaluation and, to some extent, the technical review are conducted during verification conferences at the contractor's plant. Here the actual hardware and production circumstances may be observed, touched and realistically considered. Additional information close at hand in the contractor's plant may be reviewed in support of the contractor's recommendation for procurement method. The participation of industry permits items selected for breakout to be bought by "competition with confidence". Making the breakout effective, cost saving and timely is the goal of competition with confidence. (26) Industry participation is essential to the PMC process when government has insufficient or inadequate data. (38) The technique used by industry to make a CRC is a committee approach. Functional representatives in the corporation review the need for coordinated tooling, master tooling, numerically controlled (NC) tapes, etc. Engineering considers design stability, failures of the part and any pending redesign efforts. Manufacturing, contracts and product support people are also involved in the CRC decision process. No business decision is made during the CRC process, but rather after data are requested to permit competitive purchase of competitively coded items. (15)

This process was substantially affirmed by discussions with Westinghouse representatives who state that logistics support persons develop considerable expertise during the acquisition cycle as a basis for recommendations.

By direction AFSC has the responsibility for

- (1) technical and engineering review of procurement data for items which AFSC has engineering responsibility,
- (2) assuring the data reviewed for reviewed items are adequate for the procurement methods contemplated, or reporting deficiencies to AFLC,
- (3) providing documentation of actions taken on the "Screening Analysis and Procurement Action Worksheet",
- (4) incorporating requirements into AFSC contracts to acquire contractor recommended method of procurement, and
- (5) providing funds to obtain prime contractor's PMC recommendations on systems for which AFSC has acquisition responsibilities. (4:1)

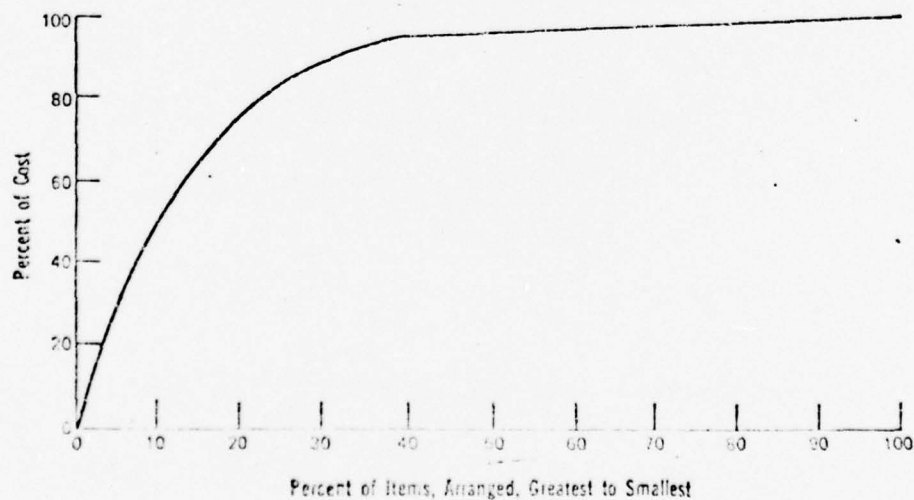
The final PMC technique used is organic screening. This is an application of a data review within the responsible Air Logistics Center on a triennial basis or review of an not previously coded for which a requirement now exists. Emphasis is dictated by item priority and annual buy value. The participants are engineers and technicians from the Air Logistics Center (ALC) Directorate of Material Management.

These few costly items as shown in the Pareto Distribution of Figure 4 are given a greater share of attention during the PMC decision process.

Figure 4

Pareto Distribution

The Significant Few vs the Insignificant Many



The PMC Psychosocial Subsystem

The individuals in social relationships, accomplishing the PMC decision process, constitute the psychosocial subsystem. The technicians and engineers as individuals find themselves relatively independent within the PMC decision context. Here the individuals can find some self-fulfillment in pursuit of the evidence to support a PMC decision. Also the government operatives have status because of their function and position authority. Their role is to carefully analyze the facts presented by the contractor in support of Contractor Recommended Codes (CRCs) regarding how spare parts should be bought. Their supervision is not noticeable. Yet, because they must live with their decision for many years to come, they have high theoretical motivation to improve the screening process.

The PMC members have formal status as members of the government team and may ask the contractor for supportive information as they evaluate the CRCs. Yet, within the government team a rather informal relationship exists. A data technician might be expected to act as chairperson and recorder. Engineers, both "service" and "procurement", and technicians work together to evaluate the contractor recommendations. Team size is likely to be small, but with the power to call in consultants as the need arises. AF Plant Representative Office AFPRO engineers may be called upon to offer advice in the name of the cognizant System Program Office (SPO) during a verification conference. The PMC team members have the authority either by delegation or through persuasion to call upon others for expert opinion during the temporary existence of the PMC team. The team participates in verification conferences for one to three weeks,

often at the contractor's or vendor's plant where extensive data are available. Communications are essential both within the group, and between the group and the contractor and his vendors.

Influence of the PMC team is exerted by emulation of past review efforts and experience, by suggestion and persuasion of contractor opinion or by coercion. The rational -- legal authority of the customer -- seller contractual relationship is subtly if not overtly evident in the PMC decision process.

The members of the PMC team are drawn together by the common task of procurement method coding, work together for a relatively brief period in a rather intensive but unstructured context. Thus, there is opportunity for self-actualization to some degree by comparison with routine administrative tasks. (39)

Figure 5

ALC RESPONSIBILITIES (REPRESENTATIVE) WORLDWIDE SUPPORT: SYSTEMS AND COMMODITIES						
	Oklahoma City	Ogden	San Antonio	Sacramento	Warner Robins	
AIRCRAFT	B-52 B-1 A7 C-135	F-4 F-101	C-5 F-106 F-102 F-5	F-111 A-10 F-105	C-141 C-130 F-15	
ENGINES	J75 J-57 F101-100 TF41		J85 F100-100 TF39 TF34			
MISSILES/ OTHER MAJOR SUB SYSTEMS	HOUND DOG SRAM	MINUTEMAN TITAN		SPACE BOOSTERS	FALCON SPARROW	
SYSTEMS/SUB	HYDRAULICS	LANDING GEAR	LIFE SUPPORT	L-SYSTEMS	AVIONICS	
EQUIPMENT	NAVIGATION AIDS	PHOTO/ TRAINERS	AEROSPACE GROUND EQUIPMENT	GROUND RADARS	FIRE FIGHTING VEHICLES	
COMMODITIES	INSTRUMENTS/ STARTERS	MUNITIONS TIRES	NUCLEAR ORDNANCE	RESISTORS/ CAPACITORS	SMALL ARMS/ PROPELLERS	

The AFR 57-6 Program Manager rarely attends the Procurement Method Coding verification conference. He convenes the team and dispatches them to the contractor's plant. The Program manager remains behind at the ALC, available for consultation and assistance to the team as required. Thus he may function as a link to other areas of expertise at the ALC for the team at the contractor's plant.

The PMC Structural Subsystem

The manner in which the tasks of an organization are divided (differentiation) and coordinated (integration) are the essence of the structural subsystem. (23:111-112) Formal and informal communications within and external to the organization are recognized. The features of an organization include a hierarchy, job descriptions, rules and procedures usually addressing task specialization.

The various Air Logistics Center (ALC) responsibilities for systems are portrayed in Figure 5. As previously indicated, the PMC organization is an ad hoc team convened to address a set of contractor recommendations (CRCs) in pursuit of an optimal means of buying spare parts expressed in the form of a PMC. Yet there is an ongoing structure in AFLC under the governing directive, AFR 57-6 and its supplements within the Material Management hierarchy. At AFLC headquarters and at each ALC there exists a staff person assigned to monitor the High Dollar Spare Parts Breakout Program. Further, at each Air Logistics Center (ALC) there is a program manager assigned to the Operations and Support Branch (MMED), Directorate

of Material Management. This program manager is to develop local policy maintain surveillance, be the control point for problem resolution, plan and conduct training on the program, and serve as program focal point for surveys, inspections and reviews. (3:1-311) When a verification meeting is required in keeping with MIL-STD 789, the program manager assumes the leadership. He orchestrates the meeting location, time, participants and representation from the cognizant engineering activity (AFSC or AFLC), procurement (PPDM), the ALC Small Business Specialists (BC) and others such as the Staff Judge Advocate (JA). (3:5-202)

It becomes evident that the AFR 57-6 program manager is the leading person in the PMC hierarchy. The program manager strives for integration of effort among the major functional specialists. In addition to responsibilities toward MIL-STD 789 verification conferences, there are requirements for organic screening occasioned by requirements computations projecting a buy or budget quantity for an item which has not been assigned a PMC. Screening priority procedures vary with the projected dollar value of the annual buy value. Organic screening is done by MMED concurrently with processing the purchase request (PR). The organic screening process as that of MIL-STD 789 seeks to identify opportunities to breakout items for competitive purchase in support of the inventory manager's requirement for assets to support operational weapon systems. (3:1-402)

A comprehensive survey of directives, operatives in government and industry, PMC verification minutes was made. No evidence has suggested the presence of any direct military involvement in the PMC decision

process. It appears to be 100% civilianized. The nearest military involvement is two levels above the operating level, unless military program office or AFPRO engineers evaluate data in support of CRCs.

The PMC Managerial Subsystem

This subsystem has been described as "spanning the entire organization by relating the organization to its environment, setting the goals, developing comprehensive, strategic and operational plans, designing the structure, and establishing control processes". (23:113) Management works with people and other resources to achieve goals by integrating diverse activities.

The AFR 57-6 project manager at the Air Logistics Center (ALC) is a key boundary spanner linking various areas of functional expertise both in the ALC hierarchy and with the contractor product support organizations. Through the efforts of the project manager verification conferences for PMC decisions are structured and participants of the government team are identified. Also problems requiring resolution, such as to the Judge Advocate or higher headquarters and AFSC.

The AFR 57-6 program manager briefs verification conferees or organic screening operatives on policy, goals, techniques and past problems. The program manager serves as the corporate memory. He uses his experiences to surveil a decision process impacting the future, often decades ahead, of these weapons in the operational inventory.

A review of pertinent directives does not illuminate if or to what extent the AFR 57-6 program managers engage in the traditional

managerial roles of planning and controlling. A discussion with the AFLC manager for the AFR 57-6 program revealed an awareness of this traditional role. The implications are discussed in the following chapters.

On the highest level, the AFLC program manager for AFR 57-6 residing in the DCS Logistics Operations, Material Requirements Directorate, serves to resolve difficulties between Logistics and Systems Commands. The AFLC program manager hosts cross talk conferences with ALC managers when funds are available. Also, the AFLC program manager (LORRS) serves as a forcing functionary to restrict repetitive use of procurement method suffix code E, part is in phased provisioning and no PMC decision has yet been made. This is achieved by a requirement for waiver prior to repetitive purchase of such parts.

The AFLC program manager reviews the minutes of verification conferences when submitted. A management indicator system is under consideration to establish a data base and for measurement of AFR 57-6 goal achievement. Also, the AFLC/LORRS reserves the right to direct stratification of projected requirement purchases for recoverable and nonrecoverable items to determine the criteria to be used in identifying high dollar value (HDV) spare parts. (3:1-201.5)

The AFLC program manager serves as the interfacing link with the Small Business Administration in assessing opportunities for increased participation by small business in production of replenishment spare parts. The Small Business Administration (SBA) has recently expressed concern to the Air Force and other military services based upon findings of their Surveillance Review Teams which examine procurement plans

and directives. The SBA concern is that the breakout of spare parts is under the complete control of technical people and almost universally the technical decision is imposed upon procurement people. (19)

Discussion with an SBA representative at one Air Logistics Center revealed a belief that more extensive participation of both SBA representatives and procurement engineers and contracting officers who are more familiar with the capabilities of industry and the marketplace is required. (34) This issue is currently under review by AFLC headquarters (LORRS).

The managerial subsystem theoretically mobilizes organizational resources to achieve an objective, does the job, and then checks the results of its efforts to achieve a unity of effort among various subsystems in task accomplishment. (23:355)

Summary

The environment of the PMC decision process is intense and complex. Rapid change is constant in the decision process which is heavily future oriented causing a long term impact upon weapon system life cycle costs. The Congress is giving increasing emphasis to accountability for costs incurred. AFLC has the responsibility for the PMC decision process and the charter for effectively emphasizing the goals established by Congress and DOD. Judgement is the essence of the PMC decision process. Its effects are long lasting and changed only with great difficulty. Operating within this environment are mutually dependent subsystems: goals, technical, psychosocial and structural. The managerial subsystem ties

the other four subsystems together for purposeful activity. All of the subsystems interact with the environment and adjust to it. Each subsystem has some boundary spanning mechanisms, but some are more evident than others. Clearly the managerial subsystem as a boundary spanning subsystem is salient. Each ALC's AFR 57-6 program manager is the key boundary spanning person in the PMC decision process. The basics of procurement method coding decision process are outlined in Figure 6.

Figure 6

PMC BASICS

	USAF	CONTRACTOR
WHO?	PRIME ALC/DMM DATA TECHNICIAN ENGINEER (AFSC/AFLC) ENGR. TECHNICIAN? PROCUREMENT ENGINEER SMALL BUSINESS SPECIALIST? JUDGE ADVOCATE?	PRODUCT SUPPORT ENTITY PRODUCT SUPPORT OPERATIVE ENGINEERING MANUFACTURING TOOLING CONTRACTS
WHAT?	DESIGNATES SPARE PARTS REVIEWS CONTRACTOR RECOM- MENDATION MAKES FINAL DETERMINATION; NOTIFY CON- TRACTOR OF DISAGREEMENT, ALLOW 45 DAYS FOR COMMENT	ANALYZES DESIGNATED SPARE PARTS, ALSO MAY RECOM- MEND OTHER PARTS BE CONSIDERED RECOMMENDS PROCUREMENT METHOD; SUPPORTS RECOM- MENDATION AT VERIFICA- TION MEETING DISAGREEMENT IS NO BASIS FOR DISPUTES
WHEN?	DURING PRODUCTION PHASE (SOME EFFORTS TO DO THIS IN FULL SCALE DEVELOPMENT) MAY BE DEFERRED UNTIL DEPLOYMENT PHASE	AS REQUIRED BY CUSTOMER/ CONTRACT
WHERE?	INITIALLY IN CONTRACTOR PLANT (UNLESS FEW ITEMS) SUBSEQUENTLY AT PRIME ALC SUBSEQUENTLY AT COMMODITY DESIGNATED ALC	AT PRIME PLANT AT MAJOR VENDOR'S PLANTS POSSIBLY AT ALC
WHY?	IAW ILS PLAN, CONTRACT & IAW AFR 57-6 & SUPPLE- MENTS BY SUBORDINATE HQTRS TO PROVIDE OPERATIONAL READINESS SUPPORT TO USER COMMANDS	IAW CONTRACT TERMS MIL STD 789 A OR B DEPENDING ON WHEN CONTRACT WAS WRITTEN

CHAPTER III

ANALYSIS OF PROCUREMENT METHOD CODING REALITIES

Having briefly examined the environment and the major subsystems functioning in the procurement method coding (PMC) decision process, an examination of some of the realities of the system making this set of important decisions.

The PMC Environment

Regarding the environment in which the PMC is resolved, the role of the Congress can be expected to expand. This assessment is based upon consideration of recent trends to strengthen the Congressional direction of Executive activity through initiation and monitoring of the Office of Federal Procurement Policy. Further, the creation of a Congressional budget office and budget committees, well staffed and interested in their charter can surely be expected to lead to more attention in the operation and maintenance, as well as central procurement, budget requests.

Also reasonable is the increased concern by contractors for weapon system degradation by parts purchased external to their control when reliability improvement warranties are imposed by the acquisition contract.

Finally, the dollars available to provide spare parts which assure operational readiness can be expected to remain tight in the foreseeable future. Careful management of these dollars remains crucial. To effectively manage the costs of spare parts an awareness of the cost driving phenomena is required.

The Goals Subsystem

There is little to suggest formal, explicit translation of broad general high-level goals by those charged with implementing the PMC decision. AFLC and subordinate ALC directives indicate little more than a reiteration of broad national policy. This does not appear to be a significant handicap, but the result is that any specificity of goals is ultimately left to become an individual matter of concern.

Whereas, AFLC planning suggests a 25% savings by making competitive an item previously purchased sold source, interviews and review of management reports at Ogden ALC show this planning factor to be optimistic. Based upon quantity of parts purchased, the range is more realistically between 10 and 17% savings by competitive breakout action. (33) Of the 199,564 items assigned PMCs in AFLC, there are 39.3% competitively coded.(1)

The Technical Subsystem

During several interviews with the operatives who accomplish the PMC decisions, the complaint surfaced that items selected for breakout and more competitive procurement often become procurement problems when inadequate contractor engineering data are delivered. Some suggest an expansion of the concept articulated by Jacques S. Gansler, Deputy Assistant Secretary of Defense for Material Acquisition. Mr. Gansler urges that, ". . . DOD should manage software as property and not solely as data. This means that management control is required to ensure a well-engineered and quality product". (16:1)

The thrust of this concept is a rethinking of the acceptance of procurement data tendered by contractors. One suggestion advanced is the use of some sort of a data warranty wherein the contractor would assure the information provided will indeed enable a successful competitor to make the subject item. (38)

Review of a draft revision of the DOD Directive 5000.1 discloses a similar concern for completeness of procurement data to permit competitive procurement

Rights in Data and Patents

Every effort will be made to negotiate at the time of the negotiation of the full scale engineering development contracts for defense materiel, the generic identification, the full rights thereto and priced options for such rights for the complete data necessary to procure and/or "second source" all or part of the defense materiel as determined by the acquisition strategy for that materiel. The negotiation should also include an agreement to license and to assist and the costs of such assistance with whomever the Government designates to produce all or part of the defense material following initial, limited production by the original developer. The data necessary for such production will likely include at least the following types of data items:

- reproducible copy of detail specification
- listing of engineering drawings
- reproducible copy of engineering drawings
- one set of engineering lines and loft layouts
- one set of process specifications, finish specifications, materials specifications, procurement specifications and test specifications
- complete parts list consisting of a numerical breakdown of all assemblies, subassemblies and detail parts
- listing of all production tools including master tools, fabrication tools, test fixtures, assembly fixtures and inspection tools
- one set of tool design drawings for tools, jigs, and fixtures
- one set of production operation sheets and assembly inspection logs

One can only wonder at the industry reaction and possible cost of such a contractual requirement. But here is another opportunity to buy data badly should the draft directive be implemented without an appropriate adjustment in data acceptance procedures which currently examine neatness and clarity while ignoring completeness.

The Psychosocial Subsystem

The interviews with the operatives in the PMC decision process revealed dedication and personal commitment to do a good job. There is some undercurrent of disenchantment with procurement engineers and small business representatives as contributors in the verification conferences. Similar feelings are reflected by those non-Material Management Directorate persons toward the decisions made without benefit of their counsel. These undercurrents are evident but unquantifiable.

The role of the procurement engineer is curious for this person is neither "fish nor foul". As an engineer, he exists external to the main engineering organization. As a procurement person, he is not a contracting officer. These perceptions appear to mitigate against the procurement engineer's acceptance in some degree in the social relationships of the PMC decision process.

The Structural Subsystem

The draft revision of AFSC/AFLC (Joint) Supplement 1 to AFR 57-6 deletes the requirement for the procurement engineer to attend verification conferences. Should this draft be implemented, the participation by those most familiar with the marketplace would diminish further.

A review of the minutes of four PMC verification conferences conducted by three ALCs are presented in Table 1.

TABLE 1
Representative Sampling of PMC Conferences 1974-1975

PMC CONF #	PRODUCT	AF REPRESENTATIVES	ITEMS VERIFIED	CODE CONTRACTOR RECOMMENDED			
				6	7	8	
1.	MATURE FIGHTER AIRCRAFT	ALC/MMSDA ALC/MMEOT ALC/MMBT PROC ENGR PLANT REP ALC/SBA REP	486	103	359	0	(NOTE: 9.2% CRC CHANGE MADE DURING VERIFICATION CONFERENCE; 19 WERE CLASSIFIED AS "OTHER" AND 5 WERE DEFERED)
2.	NEW FIGHTER AIRCRAFT	ALC/MMSDA ALC/MMEO PLANT REP AFSC/ASD ENGR ALC/SBA REP	2,598	1,536	B-88 C-201 K-10 M-102 N-301 Q-360		(NOTE: 528 CRC WERE CHANGED TO MORE COMPETITIVE CODES DURING THE CONFERENCE.)
3.	NEW AIRCRAFT ENGINE	ALC/MMSDA ALC/MMEPJ AFSC/ASD (MILITARY)	624	274	240	110	(NOTE: 239 OF THE CRC 7 ITEMS WERE ACCEPTED AS SOLE SOURCE; ONLY 91 REMAINED CRC 8.)
4.	NEW FIGHTER AIRCRAFT	ALC/MMSDA ALC/MMSDX PLANT REP/ENGR (ON CALL)	432	27	49	0	(NOTE: AGREEMENT ACHIEVED ON ONLY 76 ITEMS. THE REMAINDER WERE AT ISSUE FOR LACK OF ADEQUATE VENDOR DOCUMENTATION OR TECHNICAL DATA.)
Source: AFLC Program Manager, AFR 57-6. (38)							

The structure of the verification conferences examined is virtually totally civilianized. The Material Management Directorate is the mainstay of the conference. Only one conference included the procurement engineer. Two included a small business program representative. There is no uniformity of minutes indicating what was accomplished and what problems were encountered. The lessons learned are not reported. In all cases the contractor and the government signed the minutes.

There is no evidence that the user, either at depot maintenance or field maintenance level, is involved in the decision process. The user, usually NCOs, must live with the decision and is most intimately familiar with the hardware and the failure it sees in its operational environment.

At least one senior procurement contracting officer (PCO) has indicated the possibility of inadequate resources to properly address opportunities for breakout to more competitive methods once the PMC code is assigned. This is a rigidity which reduces competitive procurement opportunities. (40)

The Managerial Subsystem

There is little definitive guidance from AFLC headquarters as to planning, controlling, reporting or recording the PMC decision process. There is no data base accumulating in a meaningful, uniform manner to permit comparison of present and past programs, to suggest management questions which should be asked or to indicate the opportunities for praise and recognition of achievement. While there is a management indicator system in the planning stages its future is uncertain at best. It appears to be a low priority project.

There is no evidence at the ALC level that a transferable "corporate memory" is being built by the AFR 57-6 program managers. Further, there is little to indicate that the program managers are monitored by ALC directors or commanders for accomplishment, troublesome problems requiring management assistance at the ALC, or adequate inter directorate cooperation and concern. The entire PMC process has a surprisingly low visibility in the directives.

While AFLC is a highly civilianized command, there is no evidence of significant military involvement in the PMC decision process. One interview suggests an awareness by military managers of the program's results only in terms of competitive procurement dollars spent versus non competitive dollars spent. (38)

CONCLUSION AND RECOMMENDATIONS

The purpose of this study is to review and analyze the level and process as well as the boundary spanning activity of the PMC decision process as a highly significant element of ILS within AFLC. Contacts with the interested parties have revealed opinions and beliefs as well as facts in support of the following.

Conclusion

There is a long lasting impact of the PMC decision. Replenishment spare parts are bought numerous times over the increasingly longer life cycles of weapon systems. The decision is a highly technical judgement closely related to a knowledge of the operational environment, commercial marketplace and industrial capabilities. Substantial budget dollars hang in the balance as the evaluation of contractor recommended codes is accomplished. This evaluation too frequently excludes participants from the very organization charged with using the parts and with saving procurement dollars. These people do know the operational environment, the marketplace and contractor capabilities best.

Recommendations

The preceding observations suggest that there may very well be a currently suboptimal, if not mediocre, program with significant latent potential for conserving scarce resources. To do better, communications between disciplines or boundary spanning must be expanded substantially. Currently the PMC process appears to suffer from a futurity complex which gives insufficient attention to tomorrow's issues today. The result is more problems tomorrow. Consequently, the following recommendations

resulting from the preceding descriptive analysis are offered.

Some increased visibility, without smothering attention which saps the vitality, of the AFR 57-6 program appears warranted. A monthly one page executive summary from the ALC program manager direct to the ALC commander could serve to keep top management advised of progress, problems and opportunities to be of help. Copies could be furnished to others also, such as to the Director of Material Management, as appropriate. Thus, military managers would become involved to a higher degree.

A uniform, simple, meaningful format guide for recording PMC verification conference results appears necessary to build a corporate memory and to record lessons learned.

A mechanism to report to AFLC headquarters quarterly resources committed to the PMC process, screening actions accomplished, breakouts achieved, projected dollar savings (near term), manhours used and number of concurrent screening actions can build a meaningful data base. Such a report could serve as a management indicator system, corporate command memory and a basis for periodic conferences with ALC program managers to share valuable money saving techniques and ideas.

Planning and monitoring of program goals is long overdue from all appearances. Some realistic efforts along these lines within each program manager's office would appear reasonable means to encourage excellence. However, Imposition of Command goals would not gain any real benefits of commitment but would sap limited local ALC energies.

A management audit of the entire PMC process should be conducted. Numerous agencies exist which could conduct an extensive management audit of the Procurement Method Coding decision process in the very near future. As a result, other initiatives may be discovered.

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